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FEMP Funds Cost-Effective Renewable Energy at Federal Facilities Serving Native Americans

Federal facilities that serve our nation's Native Americans could soon be reaping the many benefits of renewable energy systems. These benefits include lower utility bills as well as clean, reliable electricity and heat. The Department of Energy's Federal Energy Management Program (FEMP) has approximately \$230,000 to fund cost-effective renewable energy hardware for facilities serving Native Americans; examples are Bureau of Indian Affairs schools and Indian Health Services medical facilities.

Agencies that have a promising renewable energy project that meets the criteria below have been asked to submit applications by June 10, 1999, to Patrina Eiffert, Ph.D., National Renewable Energy Laboratory, M.S. 2723, 1617 Cole Boulevard, Golden, CO 80401-3393. The electronic form is under "News and Events" and "What's New in FEMP?" on the Department of Energy's FEMP Web site: <http://www.eren.doe.gov/femp/>. Agencies could fax applications to Dr. Eiffert at 303-384-7411, or send them via e-mail to patrina_eiffert@nrel.gov. These funds must be spent by September 30, 1999. FEMP plans to fund most projects through interagency agreements.

Three criteria had to be met for Federal projects to qualify for FY 1999 funds:

1. Applicants must be applying for funds for a Federal project. The applicant must be a Federal employee applying for a Federal agency project for a Federal facility, and the agency must spend all the funds requested for system hardware and installation by September 30, 1999. These funds are intended primarily

for hardware procurements, but other options that support the deployment of renewable energy in the Federal sector can also be applicable (such as services to rehabilitate an existing but inoperable solar energy system). Applications must show that all agency approvals have been acquired, hardware designs and specifications have been completed, and vendors have been identified. A simple spending plan must also be included.

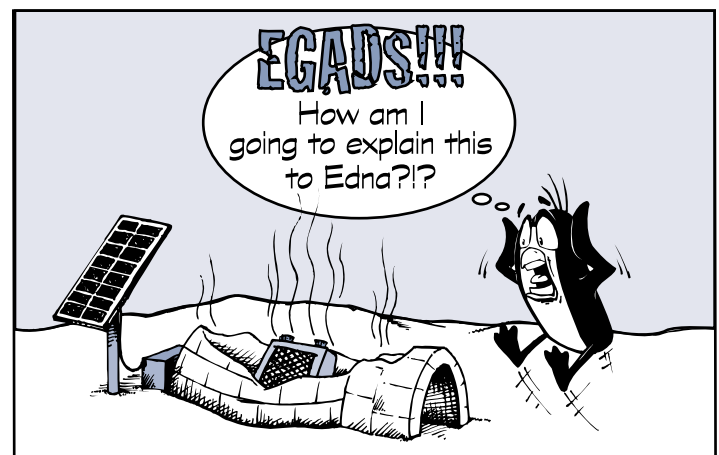
2. The project must include a renewable energy technology. Applications should be specifically for projects based on the use of renewable energy for Federal facilities serving a Native American population. Renewable energy includes, but is not limited to, energy from agricultural and urban waste, geothermal energy, solar energy, and wind energy.

3. The project must meet certain criteria for cost-effectiveness. The project must be life-cycle-cost effective and meet the congressionally mandated 25-year payback requirement, after all applicable state and utility incentives (e.g., rebates and tax credits) and any non-Federal cost-sharing are subtracted.

(Continued on p. 2)



U.S. Department of Energy
Federal Energy Management Program



PV and electric resistance heating: an unfortunate combination.

FEMA and FEMP Help Communities Be Better Prepared

The Federal Emergency Management Agency (FEMA) and DOE's Federal Energy Management Program (FEMP) have joined forces to show how renewable energy systems can help communities all across America recover faster from floods, tornadoes, hurricanes, and other weather-related disasters. These agencies are discovering that energy systems based on solar and other renewable resources can also help communities be better prepared for such disasters.

In the past few years, for example, photovoltaic (PV) energy systems have been used in parts of Florida and elsewhere to supply emergency electric power during outages caused by hurricanes. Renewables have been helping communities respond to power outages relatively quickly, with minimal interruption of critically important services provided by firefighters, emergency search-and-rescue teams, hospitals, and conventional communication systems. Renewable energy systems can also help communities be better prepared for such disasters if the systems are close at hand, or already installed, in case of an emergency.

At the January 1999 meeting of the DOE Renewable Energy Working Group (RWG), representatives of both FEMP and FEMA told attendees about the ways in which the two agencies are working together to use PV and other renewables for disaster relief. John Thornton of DOE's National Renewable

Energy Laboratory (NREL) briefed attendees on the use of PV systems. Thornton pointed out that PV-generated electricity is often cost-effective in crisis situations, and it compares favorably with conventional gasoline- and diesel-powered generators, which are the usual sources of emergency power.

When conventional generators are used, however, liquid fuels usually have to be transported with or to them; this increases both costs and risks (for example, of fuel spills). In contrast, PV systems require only a minimal amount of "fuel" (sunlight) and batteries for energy storage during cloudy periods. PV also has the advantage of being a quieter, less polluting source of electric power than conventional generators.

At the RWG meeting, Tom McQuillan of FEMA talked about the agency's recent acquisition of eight portable PV-powered generators (gensets) with funding from FEMP. McQuillan related that, initially, some FEMA staff members in the field were not very receptive to using PV gensets, perhaps because they were unfamiliar with the technology. So an advance team was assembled to go to various FEMA receiving units to explain the technology and how to use it. As a result, the reception to using PV gensets and similar products has been much better.

Two PV units have already been sent to FEMA's National Emergency Training Center in Maryland. And PV products are being considered for use in Puerto Rico because of the prevalence of hurricanes there. Two systems are also scheduled to be shipped to Columbia for use by search-and-rescue teams. McQuillan also said that, in certain locations, wind power could also be applicable in disaster relief.

Mobile photovoltaic generators like the "T-Rex" from Live Oak Solar can be transported on the ground or in the air.



Native Americans

(Continued from p. 1)

In addition, preference will be given to the following:

- (a) Projects that involve sustainable economic development in Native American communities with renewable energy technologies (e.g., that create jobs or assist with education and training programs).
- (b) Projects that leverage resources through in-kind contributions of services, equipment, buildings, or land, or that involve cost-sharing or a commitment to finance a larger number of standardized renewable energy systems at the facility or at nearby sites.
- (c) Easily replicated installations or pilot demonstrations for larger projects.
- (d) Million Solar Roofs Initiative projects that involve solar water heating, photovoltaic, or solar ventilation air preheating ("solar walls") systems.

For more information, please see the DOE FEMP Web site or send an e-mail to Dr. Eiffert at NREL. ■

DOE FEMP and FEMA also participated in a Technology Partnership for Emergency Management Workshop and Exhibition, May 17–20 in Gatlinburg, Tennessee. This workshop was designed to provide opportunities for the first responders in a crisis to interact. First responders include emergency management officials and staff from local, state, and Federal organizations and national laboratories. The exhibition format also provided opportunities to talk with industry members involved in emergency response technology development.

The many advantages of using renewable energy systems in emergency situations are detailed in a pamphlet titled "Disaster! Reduce the Risk of Insurance Loss with

Renewable Energy Technologies." For a copy, contact John Thornton at NREL, 303-384-6464; e-mail: mr_pv@nrel.gov.

See also a new FEMP fact sheet, "Counting on Solar Power for Disaster Relief," on the FEMP Web site (<http://www.eren.doe.gov/femp/techassist/renewenergy.html>). ■

Daylighting ESPC Awarded in Hawaii

By Scott Bly, Energy Manager, US Army Garrison, Hawaii

In 1998, the U.S. Army Garrison, Hawaii (USAG-HI) in the Department of Defense (DoD) received \$150,000 from FEMP to install passive solar daylighting systems in five DoD warehouses. Subsequently, USAG-HI awarded a technology-specific Energy-Savings Performance Contract (ESPC). This may be the first one in the government to be based on an unsolicited proposal.

The contract was awarded as an unsolicited proposal by the USAG-HI Directorate of Contracting (DOC) and Directorate of Public Works (DPW). Seven warehouse buildings at East Range, Schofield Barracks, are included in the first delivery order under this ESPC. The ESPC was developed as an open-ended, technology-specific contract to allow any Federal agency in the Pacific to place delivery orders against it.

USAG-HI accepted the unsolicited proposal after completing two daylighting test projects. The daylighting fixtures replace conventional electric lighting during the day, bringing daylight into the building via an enhanced skylight system. When direct and ambient sunlight strikes an impact-resistant acrylic dome, it is directed through a reflective light shaft and transmitted onto an interior diffusing lens that spreads the light evenly below. Automatic light controls turn off the existing electric lights in the building as light levels rise. The skylights are could reduce total lighting costs by 85%. The payback period is longer than that of a typical T-8 lighting retrofit, but the Btu savings are three times greater.

Daylighting is now in place in warehouses, a gym, and an aircraft hangar. USAG-HI plans to issue several additional task orders for a variety of buildings, including bowling alleys and maintenance facilities.

Daylighting reduces energy and maintenance costs, increases the amount and quality of light, and improves building occupants' productivity and morale.

For more information, contact Scott Bly, DPW, 808-656-1410, ext. 1214 (e-mail: blys@SCHOFIELD-EMH1.ARMY.MIL). ■

New daylighting retrofits for Army facilities in Hawaii include new skylights in a hangar at Wheeler Army Airfield (right) and in a warehouse at Schofield Barracks (below).



Scott Bly, U.S. Army/PIX07626



Scott Bly, U.S. Army/PIX007625

USPS Is Proactive About Solar Power

The United States Postal Service (USPS) has been working hard to speed up its many services in the past few years; it isn't wasting any time when it comes to adding solar power, either. As part of the Million Solar Roofs Initiative (MSRI), the USPS is working with staff at DOE's National Renewable Energy Laboratory (NREL) to develop and implement a strategy to install standardized (in other words, virtually off-the-shelf) solar energy systems at USPS facilities.

At present, NREL is assisting the USPS in rehabilitating an inoperable photovoltaic (PV) power system at the Rancho Mirage Post Office in California. The system was installed in 1987 to directly power DC compressors used for air-conditioning. Then in 1993, the system was modified to provide grid-connected AC power. All the equipment and wiring is in place to provide the power, but there are no connections between the PV panels and the inverters, or between the inverters and the service entrance panel. With a minimal amount of effort,

and at relatively little cost, the PV system could be connected to the inverters that are already there to produce 5 kW of AC power. The USPS is working with a local utility and NREL to get the PV system up and running and connect it to the utility grid.

Energy Secretary Bill Richardson announced in May that the USPS plans to install PV systems in 8 to 10 of its buildings in Los Angeles, as part of a green power project with the L.A. Department of Water and Power. The USPS has more than 30,000 facilities nationwide. ■



Lorenzo Roybal, an NREL engineer, tests the output of PV panels with an I-V (current-voltage) curve tracer.

Byron Stafford, NREL/PIX07535

Renewable Energy Warms Up Antarctica

If someone asked you to name the best places in the world for renewable energy systems, Antarctica might not be your first choice. It might not even be in the top ten. But in fact, that cold continent is proving to be a very good place to install renewables. And more are on the way for a new project, thanks to the efforts of staff in the National Science Foundation (NSF) and at DOE's National Renewable Energy Laboratory (NREL).

Recently, the NSF invited Patrina Eiffert, Ph.D., of NREL's FEMP team, and Ed Cannon, D.E., of the National Wind Technology Center at NREL, to Antarctica to review the use of renewable energy at various NSF sites there. They were also asked to make recommendations for additional renewable energy projects.

The NSF and its prime contractor, Antarctic Support Associates (ASA), operate major research facilities at McMurdo Station and South Pole Station in Antarctica as well as numerous sites used for field research, support, and unmanned instrumentation and communication.

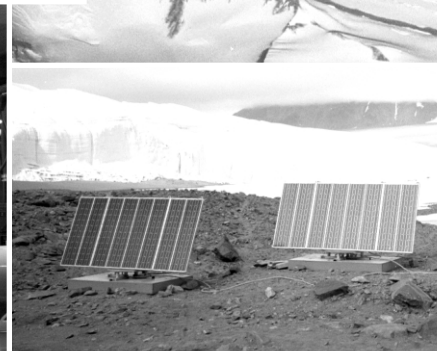
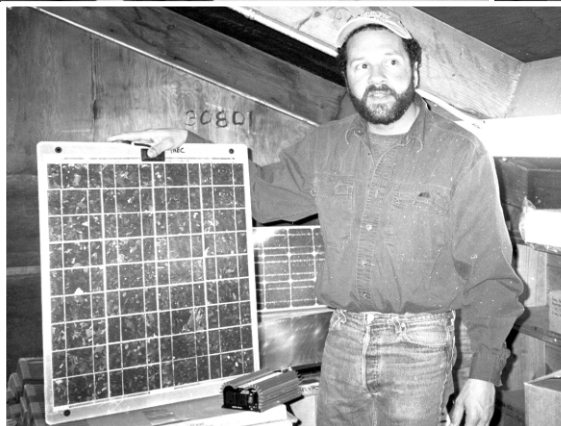
The review focused primarily on McMurdo Station, South Pole Station, field research stations in the Dry Valleys region, and communications sites on Black Island and Mount Newell. At the two major facilities, McMurdo Station and South Pole Station, the emphasis has been primarily on heat recapture from diesel-electric generation plants.

At McMurdo Station, a project was under way in which the jacket heat from generators will be used to heat a major part of

NSF's facilities and to preheat seawater entering a desalination plant. Passive solar heating is also used at some remote facilities, most notably at the two airfields serving the base. Facilities engineer Chris Martin is implementing a variety of energy conservation measures at McMurdo Station.

At South Pole Station, the jacket heat of the generators is used to heat most of the facilities in the vicinity of the generating plant, and exhaust stack heat is used to melt ice for the water supply. Within this heat-recovery system, between 80% and 85% of the energy in the fuel is used. A new, two-story dormitory there also incorporates passive solar heating panels, which completely heat the building during the six-month polar "day."

Several small outbuildings used only in summer are heated exclusively by passive solar systems. The South Pole Station Modernization (SPSM) project, scheduled



for completion in 2006, will incorporate a 35-kW photovoltaic power system. And a recent wind turbine demonstration at the Pole has increased the staff's interest in making wind energy a permanent part of the energy mix there. Extremely high fuel costs and forecasted growth in electricity demand make this station a strong candidate for additional renewable energy systems.

At Black Island and Mount Newell, communications sites are powered by hybrid power systems made up of PV panels, wind turbines, and fuel-powered generators. Both systems have operated successfully for years, and most of the power they produce is derived from renewable sources. Other unmanned sites throughout the continent operate entirely on renewable energy. Some use PV panels and enough battery capacity to carry them through the six-month polar "night"; others add small wind generators to help them through those dark months.

Most of the manned field research sites are reconfigured annually. Power generation systems are selected by the science team members who will occupy the site for the season. The Mechanical Equipment Center (MEC) at McMurdo Station, which supports the field sites, offers an array of PV panels, batteries, and inverters that are very popular with science team members. Mark Begnaud of the MEC states that renewable energy systems do not cause pollution or engine noise, which can have adverse effects on the research and staff at McMurdo.

There is great enthusiasm for renewable energy at these field sites. The large field site at Lake Hoare operated all summer using only PV energy, except for a three-day cloudy period when scientists needed backup power to operate a large freezer for specimens. Readily available, prepackaged hybrid systems containing PV panels, batteries, an inverter, and provision for wind

turbines and gas generators would no doubt increase the use of renewables even more. NSF and ASA plan to field-test some pre-packaged units from various manufacturers in the near future.

The Antarctic is one of the last pristine environments left on Earth. Much of its scientific value derives directly from the lack of locally generated pollution, and more than 40 nations have joined together in an agreement to preserve this situation. Renewable energy is already helping to reduce the environmental impacts of the work that scientists and support people are doing in Antarctica. The NSF ASA and NREL are working together to help renewables contribute even more.

For more information, please contact Ed Cannon, 303-384-6920, or Patrina Eiffert, 303-384-7548, at NREL. ■

Ed Cannon (below left) and Patrina Eiffert (right) of NREL flew "cargo class."



Photos: PIX07597 through PIX07615



PV at Fort Huachuca, Arizona

Two new photovoltaic (PV) electric power systems were installed late last year at Fort Huachuca in Arizona: a 16-panel system at Barnes Field House (right) and an 8-panel system at the main supply warehouse. Both are grid-connected peaking systems. The Barnes Field House system faces due west at a 45-degree tilt and is rated at 4.8 peak kilowatts; the warehouse system faces 20 degrees south of west at a 45-degree tilt and is rated at 2.4 peak kilowatts. For more information, contact William Stein at Fort Huachuca: steinw@HUACHUCA-EMH1.ARMY.MIL. ■



FEMP Develops a Federal Strategy for Deploying Renewables

To help the nation reduce greenhouse gas emissions as well as Federal energy costs, members of the Renewable Energy Working Group (RWG) of the Department of Energy's Federal Energy Management Program (FEMP) have developed an integrated strategy for deploying more renewable energy technologies in the Federal sector. During the January 1999 meeting of the RWG, members discussed specific key activities for FY 1999 in support of the plan.

The draft plan calls for FEMP to assist the government in reaching its goal for renewable energy technologies through three strategic pathways: by installing decentralized renewable energy systems in Federal facilities, by purchasing green power, and by implementing low-energy design principles in new construction.

1. *Purchase and install decentralized renewable energy systems in Federal facilities.* In this pathway, FEMP helps agencies leverage their funding in order to purchase renewable energy systems, works with the General Services Administration (GSA) and others to enhance Federal procurement mechanisms, and helps to develop a Federal capability for implementing renewable technologies.

Specific activities proposed for FY 1999 include providing direct support to six or eight projects that are being identified through activities of the DOE Regional Offices, the Energy Showcase program, and agency requests for assistance from FEMP. Direct project support would target cost-effective systems in at least two Million Solar Roofs Initiative communities.

2. *Purchase green power.* This pathway calls for the government to establish policies that will institutionalize purchases of electric power produced by renewable energy systems, and develop organizational capabilities that support green power purchases.

Specific FEMP activities include working with the Environmental Protection Agency on an RFP to buy green power for a facility in California. Staff plan to analyze the impact of provisions in a pending Executive Order regarding green power procurement requirements. FEMP also plans to support utilities and agencies interested in developing green power pilot projects.

3. *Implement low-energy design principles in new Federal construction.* In the third pathway, FEMP assists the government in establishing policies on low-energy building design for new Federal construction. Low-energy design incorporates passive solar principles and other energy-saving technologies and practices. Specific actions include the following:

- Identify and target opportunities
- Develop an organizational capacity among architectural and engineering companies
- Establish partnerships with other Federal agencies
- Showcase successful projects
- Expand financing opportunities for solar design.

In FY 1998, many support activities were targeted toward projects of the GSA and the Navy. In FY 1999, FEMP will continue to work with the GSA, the Navy, and other agencies on activities supporting this pathway.

In addition, FEMP must take three overarching actions that support all three pathways:

1. *Coordinate agency programs to leverage resources and emphasize renewables.*
2. *Secure commitments and support from Federal leadership.*
3. *Partner with others to develop a clear message that resonates with the public.*

Specific activities include presenting papers or chairing panels on renewables at major conferences sponsored by DOE and other government agencies and interested groups. RWG members also discussed distributing subcontractor reports to a broader audience and completing a strategy to promote the co-firing of biomass with coal at Federal facilities.

To obtain a draft copy of the Integrated Strategy for Deploying Renewables in the Federal Sector, contact Nancy Carlisle (303-384-7509) or Patrina Eiffert (303-384-7548) of the FEMP RWG. ■

YOU HAVE
the POWER.



A Federal Energy Management Program initiative, You Have the Power is designed to raise awareness of energy efficiency in the Federal sector. Find out more about it at <http://www.eren.doe.gov/femp>

Treasure Chest: Events, Publications, and Web Sites

Events

Daylighting Goes Mainstream—How to Daylight Every Office: Discover how daylighting can reduce building operating costs, and the use of pollution-causing energy sources, without significantly increasing construction costs; find out, too, how it can enhance your productivity, health, and well-being.

Location: Madison, WI

Date: June 10, 1999

Contact: Marge Anderson, 608-238-8276, x32

ASES Annual Conference—Solar 99: Growing the Market: More than 50 technical sessions, forums, symposia, and workshops feature such topics as photovoltaics, emerging architecture, energy efficiency, and "green" businesses. Nearly 1,000 researchers, designers, and builders will meet with educators, policy makers, solar enthusiasts, and others to share information about technical innovations and market opportunities. Special activities include the "Maine Solar Blast." Sponsors include the American Institute of Architects, Northeast Utilities, the City of Portland, the Northeast Sustainable Energy Association, and many others.

Location: Portland, ME

Dates: June 12—17, 1999

Contact: Fran Combs, 303-443-3130

www.ases.org

American Council for an Energy-Efficient Economy—Industry and Innovation in the 21st Century: ACEEE's 1999 summer study focuses on energy efficiency in industry. About 60 papers will be formally presented, as well as several workshops and roundtables. Participants can also select topics for several activities and sign up for afternoon tours of local companies. Sponsors include the NY State Energy Research and Development Authority, DOE, EPA, NREL, Boston Edison, and several others.

Location: Saratoga Springs, NY

Dates: June 15—18, 1999

Contact: Rebecca Lunetta, 202-429-8873

www.conf@aceee.org

Energy '99: This conference and exhibition is for government energy managers and all others who plan, coordinate, or carry out energy efficiency, renewable energy, or water conservation projects. Hands-on and interactive sessions will be conducted by experts in technologies, programs and policies, building design, financing, and maintenance. The latest technologies from more than 150 suppliers will be displayed. Sponsors include DOE FEMP, the Dept. of Defense, and the GSA, with support from the State of Florida and several utilities and private companies.

Location: Omni Rosen Convention Center, Orlando, FL

Dates: August 23—25, 1999

Contact: JoAnn Stirling, 407-638-1014

www.energy99.ee.doe.gov

Publications

Whole-Building Design Guide on the Web: A new *Whole-Building Design Guide* is on the Web; it was prepared by staff of the Naval Facilities Engineering Command (NAVFAC), Atlantic Division, in Norfolk, Virginia, with assistance from the Passive Solar Industries Council and others. Dennis Talton of NAVFAC has been working with the National Institute of Building Sciences to include the guide in the Construction Criteria Data Base. See http://www.efdlant.navy.mil/Lantops_15/home.htm.

Renew the Government — Summary of Projects and Lessons Learned: This well-illustrated publication describes 122 current photovoltaic (PV) energy projects in the Bureau of Land Management, the National Park Service, and the USDA Forest Service. Prepared by DOE's Sandia National Laboratories, it contains contributions from Mike Thomas, Hal Post, and others in the Sandia Photovoltaic Systems Assistance Center. Printed copies are available from DOE's Office of Scientific and Technical Information, Oak Ridge, Tennessee (615-576-8401) and from the National Technical Information Service (703-605-6000). An electronic copy is on Sandia's PV Web site at <http://www.sandia.gov/pv/>.

Web Sites

General Information

Center of Excellence for Sustainable Development
<http://www.sustainable.doe.gov>

Federal Energy Management Program (FEMP)
<http://www.eren.doe.gov/femp>

National Renewable Energy Laboratory
<http://www.nrel.gov>

NREL's Photographic Information Exchange ("PIX")
<http://http://www.nrel.gov/data/pix/pix.html>

Sandia National Laboratories
http://www.sandia.gov/Renewable_Energy/renewable

U.S. Department of Energy (DOE)
<http://www.doe.gov>

U.S. DOE Energy Efficiency and Renewable Energy Network (EREN)
<http://www.eren.doe.gov>

U.S. Environmental Protection Agency
<http://www.epa.gov>

Western Area Power Administration
<http://www.energy.wsu.edu/org/western>

Policy

Alliance to Save Energy
<http://www.ase.org>

Database of State Incentives for Renewable Energy (DSIRE)
<http://www.solar.mck.ncsu.edu/dsire>

President's Million Solar Roofs Initiative
<http://www.millionsolarroofs.com>

Renewable Energy Policy Project
<http://www.repp.org>

Worldwatch Institute
<http://www.worldwatch.org>

Trade Associations/Nonprofit or Professional Organizations

American Solar Energy Society (ASES)
<http://www.ases.org>

American Wind Energy Association (AWEA)
<http://www.igc.org/awea>

Passive Solar Industries Council (PSIC)
<http://www.psic.org>

Solar Energy Industries Association (SEIA)
<http://www.seia.org>

United BioEnergy Commercialization Association (UBECA)
<http://www.ubeca.org>

Utility PhotoVoltaic Group (UPVG)
<http://www.ttc.org/upvg>

Education

Center for Renewable Energy and Sustainable Technology (CREST)
<http://www.solstice.crest.org>

Energy Efficiency and Renewable Energy Network (EREN)
<http://www.eren.doe.gov/>

Florida Solar Energy Center (FSEC)
<http://www.fsec.ucf.edu>

Engineering and Construction

Association of Energy Engineers
<http://www.aeecenter.org>

Green Buildings Council
<http://www.usgbc.org>

National Institute of Building Sciences Construction Criteria Base
<http://www.ccb.org>
http://www.efdlant.navy.mil/Lantops_15/home.htm

Green Power

The Automated Power Exchange (APX) Green Power Market
http://www.energy-exchange.com/html/apx_green.htm

California Retail Green Power Products ---
http://www.eren.doe.gov/greenpower/california/lbl_table.html

Green Buyers Beware (Public Citizen Report)
<http://www.citizen.org/Press/greenreport.htm>

Green-e Certification
<http://www.green-e.org/>

The Green Power Network
<http://http://www.eren.doe.gov/greenpower>
<http://www.eren.doe.gov/greenpower/marketing.html#mps>
<http://www.eren.doe.gov/greenpower/renew.html>
<http://www.eren.doe.gov/greenpower/california/index.html#products>

Natural Resources Defense Council: Choosing Green Power in California
<http://www.nrdc.org/howto/encagp.html#criteria>

Policy Report on California Renewables Funding
http://www.energy.ca.gov/restructuring/AB1890_renewables/97-03-28_final_report.html

Registered Renewables Providers in California
<http://www.energy.ca.gov/greenpower/providers.html>

SMUD PV Pioneer Program
<http://www.smud.org/energy/solar>

Save with Solar


Save with Solar: A Quarterly Technical Bulletin for Federal Solar Energy Champions

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Power Pod Corp./PIX07422

The US Department of Agriculture (USDA) Forest Service is partnering with a manufacturer of photovoltaic power systems to supply electricity to firefighters in training. Here, in front of three PV-powered generators in Montana, Steve Oravetz of the USDA Forest Service (right) shakes hands with Kerry Kalarney of Power Pod Corp., the PV manufacturer, to seal an agreement in which Power Pod will supply standardized PV generators in different sizes to fire camps. ■